

53

FIELD BOOK

360 A

No 153

SARN ^o	JobN ^o	Data	Pg	to Pg
7	2601	Transit Notes	1	8
7	2601	Level Notes	12	24
6	2602	Transit Notes	27	34
6	2602	Level "	34	43
6	2602	Slope Stakes	43	50
6	2602	Offtake Levels	50	52
6	2602	Curve Level Notes	52	57
6	2602	Curve X-Sect. Slope Stakes	55	
7	2601	Slope Stakes	61	69
7	2601	Re-X-Sec. Notes	69	
6	2602	Finishing Stakes	56	59
7	2601	" "	70	76

SAR #7 Cass County

Job #2601

9-24-25

Weather - Clear + Cool

Sta.	Defl.	Angle	Mag. Bearing
			↓ 20 ↑
P.O.T. 12+85.3			
6+90			Clear 33'
+74			Grub 23'
0+00			↓
			N82°30'E

21	Party { ARTaubman TR Tom Lee - Chair B Mowatt "
20	
19	
18	36" x 50' M.C. In Place (48') → Correct
17	
16	FE 16+00
15	
14	
13	
+25.5	
12	RRs { Tel. P. 45.4' N.W. 100' Aspen 41.0' S
11	
	FE 11+10
10	
9	
8	
7	
+90	
6	
5	
+74	
4	
3	
2	
1	
0	RRs { Stump NE 69.6' Tel. Pole NW 68.2'

1/4 Cor. bet. Sec's
21 & 28 - 139-30

Wood Stake

9-24-25

Sta	Defl	Angle	Mag. Bearing
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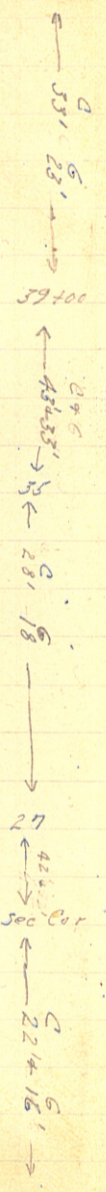
+50
P.O.T. 38+00

+28

+74

26+23.7 L 0°15' N62°15'E
25+50

22+10



- 44
- 43
- 42
- 41
- 150
- 40
- 39
- 38
- 37
- +28
- 36
- 35
- 34
- 33
- 32
- +74
- 31
- 30
- 29
- 28
- 27
- 26
- 25
- 24
- 23
- 22

RP's { 4" Oak NW 52.0'
7" Aspen S. 34.0'

Cor. Sec. 21, 22, 27, 28 Wood 26 x
139-30 Stake +50
Tpi. Road 25

FE 26+40
RP's { 7" J.P.S.E. 52.3'
8" S 34.7'

Sta Defl Angle Mag. Bearing

PT 65+57.52 T=169.25 LC=327.27
 EXT=26.8 R=520.9'
 Δ=11°

PI 61+99.5 R 36° N56°24'E
 = 61+88.27
 Curve Defl. { PT+51.57=18°00'
 +50=12°05'
 62=9°20'
 +50=6°35'
 61=3°50'
 +50=1°05'

PT 60+30.25 PC T=175.75 LC=350'
 EXT=10.85 R=1432.5'
 Δ=4°

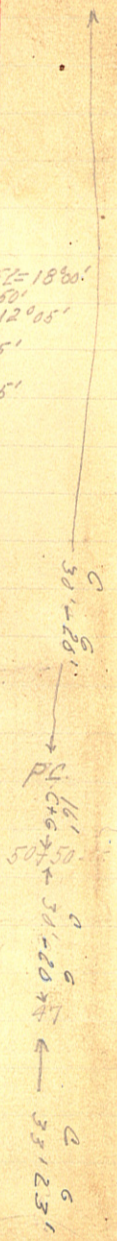
PI 58+56 R 14° N20°24'E
 = 58+54.5
 Curve Defl. { +30.25=5°00'
 60=6°24'
 59=4°24'
 58=2°24'
 57=0°24'

PC 56+80.25
 PT 55+56.01 → Revised on Plans (Pg. 1)

PI 54+00 L 75°51' N6°24'E
 = 53+32.77
 LC=379.25 Ext=76.7'
 R=286.5'
 Tan=223.24' Δ=20°

52+59.5
 PC 51+76.76
 Curve Defls { +36.51=37°55'
 +50=37°19'
 55=32°01'
 +50=27°19'
 54=22°19'
 +50=17°19'
 53=12°19'
 +50=7°19'
 52=2°19'

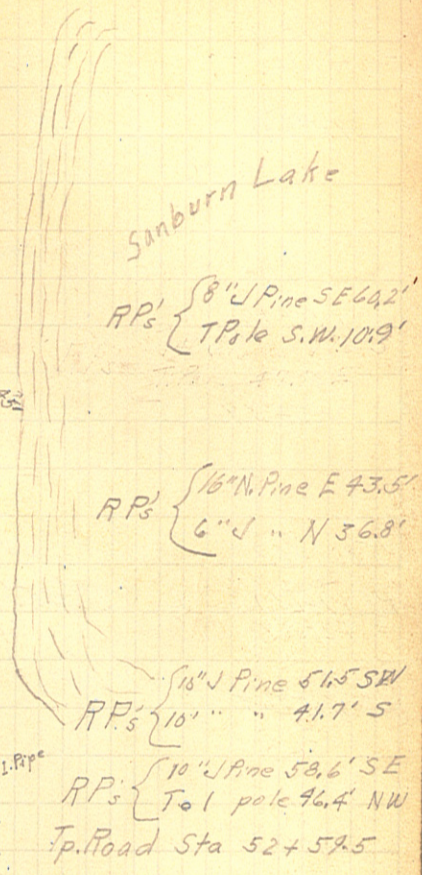
45+00



9-26-25 3
 Weather - Fair + Cool

FE 64+50

65
 64
 63
 62
 61
 60
 59
 58
 57
 56
 55
 54
 53
 52
 51
 50
 49
 48
 47
 46
 45



1/4 Cor. between sec. 22, 27 +59.5 01 R.P.
 139-50

FE 49+00

Sta	Defl.	Angle	Bearing
PI 91+00 =	R	45°30'	N 81°34' E
= 90+87.22		T=124.14' L.C.=227.5'	
PC 89+79.86		Ext.=23.05' $\Delta=20^\circ$	R=286.5'
		Curve Defls:	+101.36=22°45' 91=22°01' +50.77=01' 91=12°01' +50.77=01' 90=2°01'
		→ Revised on Plans Pg. 7	

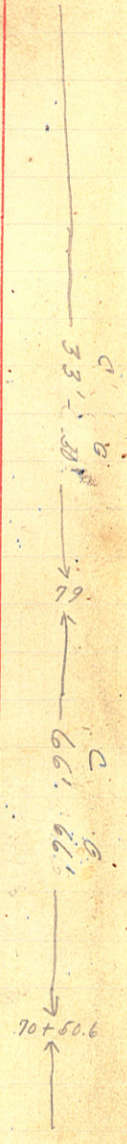
POT 83+37

PT 80+46.38		T=125.75' L.C.=248.96'	
PI 79+23.15 =	L	Ext.=10.96' R=716.25' $\Delta=8^\circ$	
= +20.63		Curve Defls:	19°55' N 36°24' E +46.38=9°59' 80=8°06' 79=4°06' 78=0°06'
PC=77+99.4			

74+43

PI 70+50.6 =

68+00

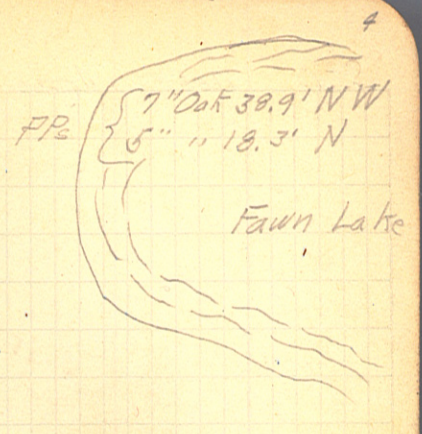


9-26-25

9-30-25
Weather - Cool & Misty



Place Culvert? Sta 73+82



RP's { 6" Aspen 54.7' S.W.
Tel. pole 51.1' N.W.

RP's { 10" J. Pine N.W. 91.0
Tel. Pole N 48.5'

RP's { 7" Oak N.W. 35.4'
10' " N. 26.0'

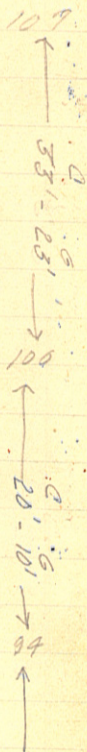
91
90
89
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86
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84
83
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73
72
71
70
69
68

Sta Defl. Angle Mag. Bearing

107+00

PT 102+44.7
 PI 101+39.7 = 101+39.1
 PC 100+34.4
 T=103.3 LC=210'
 Ext.=4.8 ft
 Δ=5°
 10°50' NR90
 Curve
 Defl. 101=1038'

PT 96+25.42
 PI 95+66 = 95+64.84
 PC 94+35.42
 PT 92+07.36
 92+00
 T=130.58' LC=260.0'
 Ext.=7.4' Δ=5°
 130° N68°54'E
 +95.42=6930'
 Curve
 Defl. 96=4007'
 95=1037'



End of Survey

Rainy Lake

10-1-25
 Weather -
 Cool & Cloudy

R.P.s { 5" Poplar 512' N
 5" Oak 490' NW

R.P.s { 3" J Pine 34.7' N
 Tel. Pole 35.5' NW

FE Sta 99+25

R.P.s { 2" W.P. Stump N 30.8'
 3" Oak NE 30.7'

Fawn Lake

114
 113
 112
 111
 110
 109
 108
 107
 106
 105
 104
 103
 102
 101
 100
 99
 30'-98"
 97
 96
 95
 94
 93
 92

Sta Defl. Angle Mag. Bearing

10-1-25

Revision from Sta 68+79.32 to Sta 79+60.45 = PI 79+23.15 = PI 79+20.63

PT 76-42.04
PI 75-43 = +35.52
L 37° N 36° 24' E
T=106.52' LC=205.56'
EXT.=17.35' R=318.3'
D=18°

PC 74+36.48
PT 72+19.32
Curve Defl's
+42.04 = 18° 36'
76 = 14° 43'
+50 = 10° 13'
75 = 5° 43'
+50 = 1° 13'

PI 70+50.6 = +48.04
R 17° N 73° 24' E
T=171.28' LC=340.0'
EXT.=12.7' R=1146.0' D=5°

PC 68+79.32
68+00
Curve Defl's
+19.32 = 8° 30'
72 = 5° 01'
71 = 5° 36'
70 = 3° 01'
69 = 0° 36'

9-30-25
Weather -
Cool + Misty

78
77
76
75
74
73
72
71
70
69
68

RP's { 8" Poplar SE 27.4'
14" " E 31.2'
FE Sta PI 74+43

RP's { 7" oak NW 35.4'
10" " N 26.0'

Sanburn Lake

Revisions

Sta Defl. Angle Mag. Bearing
 PT=92+53.37=92+58.85

PI 91+00= R 45°30' N 81°55'E
 90+78.37
 D=140 T=171.65'
 L=325' Ext=34.53'
 R=409.29

PC=89+28.37

Defl's {
 +53.37=22°45'
 92=190°01'
 +50=150°31'
 91=120°01'
 +50=80°31'
 90=50°01'
 89+50=103°

PT 60+30.25

PI 58+56= R 13° N 20°29'E
 58+54.53
 D=309.3' T=175.67
 L=349.77 Ext=9.98
 R=

PC 56+80.93

Defl's {
 +30.25=6°31'
 60=5°57'
 58=40°05'
 58=20°13'
 57=0°21'

PT 55+45.9= +99.0

PI 53+90.9= L 74°51' N 7°24'E
 53+29.75
 D=200 T=219.25'
 L=374.25' Ext 74.20
 R=286.5

PC 51+71.65

Defl's {
 +45.9=37°26'
 55=320°51'
 +50=270°50'
 54=220°50'
 +50=170°50'
 53=120°50'
 +50=70°50'
 52=2°50'

Sta. Defl. Angle Mag. Bearing

Level Notes

S.A.P.#7 Job#

2601 Cass County

12

Sta	-	HI	+	Ele
BM		1331.37	5.67	1325.70
TP	4.41			1326.96
+		1331.19	4.23	
TP	5.03			26.16
+		31.21	5.05	
TP	5.77			26.04
+		28.64	2.60	
TP	8.32			20.32
+		21.83	1.51	
TP	0.26			21.57
+		34.19	12.62	
TP	1.42			32.77
+		34.02	1.25	
TP	4.98			29.04
+		33.47	4.43	
TP	3.74			29.73
+		36.30	6.57	
TP	3.26			33.04
+		38.09	5.05	
TP	3.05			35.04
+		40.84	5.80	
TP	3.97			36.87
+		40.03	3.16	

Top of rail in front of Depot; Back us.

Sta	-	H I	+	Ele
TP	11.07	1340.03		1328.96
+		29.13	0.17	
TP	0.67			28.46
+		37.59	9.13	
TP	12.19			25.40
+		33.33	7.93	
TP	2.75			30.58
+		34.63	4.05	
TP	4.82			29.81
+		36.71	6.90	
TP	5.98			30.73
+		32.04	1.31	
TP	5.55			26.49
+		36.06	9.57	
TP	6.71			29.35
+		36.69	7.26	
TP	4.13			32.48
-		37.79	5.31	
B.M.	3.24			1334.55

On Tel. Pole N.W. of Sta 0+00

X-sec Notes SAR#7-2601

Sta	-	HJ	+	Elev.
BM		1335.88	1.33	1334.55
0+00	3.5			32.4
1+00	5.5			30.4
2+00	6.8			29.1
3+00	6.8			29.1
TP 4+00	5.76			30.12
+		1341.99	11.87	
+74	9.0			33.0
5+00	8.2			33.8
6+00	7.0			35.0
490	4.4			37.6
7+00	4.4			37.6
8+00	7.0			35.0
9+00	9.2			32.8
10+00	9.7			32.3
11	9.0			33.0
TP 12	5.26			36.73
+		42.38	5.65	
+85.3	2.3			40.1
13	2.6			39.8
14	5.0			37.4
15	4.8			37.6
16	5.4			37.0
17	8.4			34.0

HI = 5.6

9-25-25
Weather - Clear & Cool ¹⁴

On Tel. Pole N.W. Sta 0+00

L	6.0 5.7 7.5 7.6 6.0	6.0 7.8 7.9 5.7	L
	30.0 17.0 16.5 14.0 11.0	12.0 16.0 13.0 19.0	
	6.0 5.6 7.6 7.6 5.8	5.7 7.5 7.5 5.5 5.9	
	30.0 19.0 17.0 15.0 12.0	12.0 16.0 13.0 17.0 30.0	
L	6.6 6.5 7.8 7.9 6.6	5.5 7.4 7.4 5.8 5.2	L
	30.0 21.0 19.0 17.0 13.0	11.0 15.0 12.0 18.0 22.0	
	7.0 6.7 7.6 8.0 5.8	5.8 7.9 7.9 5.8 5.8	
	31.0 20.0 19.0 17.0 13.0	7.0 12.0 14.0 16.0 26.0	
L	7.0 7.6 7.6 5.9	5.6 7.0 7.0 4.9 4.2	CS
	19.0 18.0 12.0 13.0	9.0 12.0 14.0 18.0 27.0	
CS.	6.9 5.6 7.6 5.7	5.8 7.1 7.1 2.7 2.7	L
	27.0 18.0 15.0 12.0	9.0 12.0 14.0 17.0 25.0	
CS.	8.0 6.8 7.5 5.9	5.7 7.2 7.2 3.7 3.3	CS.
	26.0 18.0 16.0 12.0	8.0 11.0 13.0 16.0 22.0	
CS	8.3 7.2 8.2 4.2 5.8	5.6 2.7 7.1 4.1 4.1	L
	28.0 20.0 19.0 17.0 12.0	10.0 13.0 15.0 18.0 26.0	
CS.	6.9 6.0 8.1 5.9	6.0 7.0 7.0 4.6 4.2	L
	30.0 21.0 18.0 17.0 12.0	10.0 13.0 15.0 16.0 23.0	
	6.3 5.8 8.0 6.0 5.8	6.0 7.2 7.2 4.8 4.6	CS
	30.0 22.0 18.0 16.0 12.0	10.0 12.0 14.0 15.0 22	
L	5.3 5.1 7.1 7.1 5.4	5.8 7.3 7.3 4.7 5.1	ASL
	26.0 19.0 15.0 16.0 12.0	8.0 12.0 14.0 15.0 22.0 26.0	
L	5.8 6.1 7.7 5.8	5.8 7.2 7.2 5.5 5.7	L
	27.0 19.0 18.0 11.0	7.0 11.0 13.0 15.0 24.0	
CS	7.0 6.5 7.9 7.9 5.8	5.6 7.6 6.8 6.4	L
	27.0 19.0 17.0 15.0 12.0	7.0 14.0 15.0 24.0	
L	7.6 7.8 8.1 8.1 6.2	5.9 7.2 7.8	L
	27.0 19.0 18.0 16.0 12.0	11.0 14.0 24.0	
	4.0 3.8 7.5 7.5 5.4	5.8 6.6 6.6 4.0 5.2	CS
	34.0 26.0 20.0 18.0 13.0	9.0 10.0 12.0 15.0 26.0	
L	4.3 4.8 7.0 7.0 5.8	6.0 7.1 7.1 4.5 4.2	L
	30.0 23.0 21.0 19.0 14.0	9.0 11.0 15.0 16.0 24.0	
L	3.7 4.0 6.9 5.6	6.0 7.1 7.1 3.8 3.8 3.7	CS
	30.0 23.0 21.0 14.0	9.0 11.0 13.0 16.0 21.0 27.0	
CS	6.5 6.0 7.8 5.7	5.7 7.4 6.0 6.0 6.5	L
	29.0 21.0 19.0 14.0	7.0 12.0 14.0 25.0 29.0	
L	5.5 5.6 6.8 6.5 5.4 5.3	5.9 8.0 7.3 7.7 2.5	L
	29.0 21.0 19.0 17.0 14.0 6.0	6.0 11.0 14.0 20.0 28.0	
L	1.2 6.0 6.0 5.2 5.3	6.5 2.7 3.5 3.6	CS
	24.0 14.0 17.0 14.0 5.0	9.0 12.0 18.0 24.0	
CS	0.0 0.2 6.6 6.8 6.7 5.3	6.1 7.1 1.8 2.2	CS.
	34.0 25.0 19.0 17.0 14.0 5.0	5.0 6.0 14.0 21.0	

Sta	-	H1	+	E1e
P 17	12.40			1329.98
+		1330.23	0.25	
18	2.1			28.1
19	7.0			23.2
20	8.7			21.5
21	8.9			21.3
P 22	10.05			1320.18
+		1328.00	7.82	
23	9.7			18.3
24	8.0			20.0
25	5.3			22.7
+5.0	4.9			23.1
26	5.8			22.2
+23.7	6.3			21.7
BM	3.83			1324.17
27	8.2			19.8
+55	7.1			20.9
28	3.7			24.3
P	1.30			1326.70
+		1331.17	4.47	
29	0.5			30.7
30	6.7			24.5
31	10.5			20.7
+14	10.0			21.2

15.5
11.0

HI = 5.6

CS.	23	29	7.1	7.1	5.7	5.7	5.7	6.5	1.5	1.0	C.S.
	35.0	26.0	21.0	14.0	14.1	5.0	5.0	10.0	16.0	35.0	
		15.5	12.9	5.8	5.7	5.7	17.3	13.5			C.S.
		33.0	23.0	12.0	5.0	4.0	22.0	32.0			
CS.	5.0	7.3	7.3	5.8	5.3	5.8	7.2	3.5	3.0	3.1	L
	22.0	17.0	17.0	13.0	6.0	4.0	9.0	12.0	10.0	25.0	
CS.	8.0	8.2	2.1	6.0	5.5	5.6	7.7	7.7	4.6	4.0	C.S.
	30.0	25.0	23.0	15.0	6.0	6.0	9.0	11.0	12.0	19.0	
L	6.1	7.2	7.2	6.0	5.7	5.6	6.9	6.2	3.5	3.3	L
	25.0	24.0	22.0	19.0	8.0	4.0	7.0	9.0	10.0	22.0	
CS.	7.4	7.1	8.1	5.5	5.6	5.6	8.2	8.2	8.0	8.7	C.S.
	33.0	25.0	23.0	17.0	3.0	3.0	9.0	9.0	11.0	19.0	
CS.	5.7	5.1	6.9	6.9	5.6	5.7	6.9	6.9	4.7	4.9	L
	32.0	24.0	22.0	20.0	18.0	4.0	8.0	9.0	11.0	25.0	
	5.9	5.3	6.9	6.9	5.5	5.6	7.1	7.1	5.1	5.3	L
	33.0	24.0	23.0	21.0	18.0	4.0	7.0	9.1	10.8	16.0	
L	5.2	6.8	6.8	6.2	5.6	5.6	7.2	6.6	3.0	3.6	L
	24.0	23.0	21.0	18.0	3.0	3.0	9.0	14.0	18.0	27.0	
CS.	3.9	4.2	5.7	5.6	5.6	5.6	6.7	5.7	5.4	5.8	C.S.
	35.0	25.0	22.0	19.0	3.0	3.0	9.1	11.0	20.0	27.0	
CS.	4.9	5.1	5.6	5.6	5.6	5.6	6.5	5.2	5.2		L
	34.0	24.0	19.0		4.0	4.0	8.0	9.0	16.0		
On 8" J. Pine (R.P.)											
	8.1	7.5	6.6	5.6	5.9	5.9	6.7	5.6	4.8		C.S.
	30.0	25.0	19.0	15.0	5.0	5.0	8.0	10.0	19.0		
CS.	12.6	11.7	6.2	5.4	5.6	5.6	6.4	5.6	4.1	2.6	C.S.
	30.0	26.0	15.0	7.0	3.0	3.0	6.0	8.0	16.0	24.0	
	8.7	7.9	6.6	5.3	6.1	5.5	2.8	1.6	1.0	0.0	C.S.
	33.0	28.0	21.0	16.0	15.0	4.0	4.0	11.0	17.0	23.0	
C.S.	1.8	1.2	5.2	5.2	5.6	5.6	1.8	0.5			L
	27.0	18.0	14.0		1.0	1.0	6.0	11.0			
L	3.5	4.6	5.9	5.4	5.6	5.6	6.0	7.0	6.5		C.S.
	27.0	26.0	13.0	16.0	4.0	4.0	8.0	8.0	16.0	25.0	
CS.	9.1	9.1	7.6	5.9	5.6	5.6	6.2	5.4	1.5	1.0	C.S.
	30.0	24.0	23.0	17.0	4.0	4.0	6.0	8.0	15.0	22.0	
	5.3	5.7	6.4	5.3	6.1	6.1	3.3	1.6			C.S.
	32.0	25.0	24.0	20.0	5.1	5.1	7.0	15.0			

Sta	-	H!	+	Ele
P 32	10.63			1320.54
+		1331.42	10.88	
33	14.6			16.8
34	14.9			16.5
35	9.0			21.6
BM	0.82			1330.60
36	1.6			29.8
P	0.08			1331.34
+		1344.32	12.98	
+28	13.1			31.2
37	7.3			37.0
38	2.3			42.0
39	4.1			40.2
40	8.9			35.4
P 41	0.50			1335.82
+		1346.02	10.20	
40+50	11.5			34.5
42+00	5.0			41.0
43	4.3			41.7
44	5.5			40.5
45	6.2			39.8
BM	5.18			1340.84
46	5.9			40.1
P	6.37			1339.65
+				

HI = 5.6 16

L	Q	R	
L	6.1 6.0 6.8 5.7 31.0 26.0 24.0 19.1	5.6 2.3 0.6 0.2 5.0 7.0 15.0 20.0	C.S
L	7.1 6.9 7.5 7.1 5.8 31.0 24.0 23.0 21.0 17.0	5.6 6.0 2.8 4.0 7.0 8.0	C.S
L	9.5 9.1 5.8 24.0 18.0 13.0	5.0 10.1 10.3 4.0 18.1 15.0	L
C.S.	3.8 4.1 5.9 5.5 27.0 19.0 17.0 16.0	5.5 5.9 4.0 3.5 7.0 9.0 10.0 20.0	L
Tel. pole NE of Sta 35			
L	7.4 7.4 6.2 24.0 19.0 16.0	5.5 3.1 2.0 5.0 7.0 14.0	C.S
C.S.	7.9 6.9 5.1 29.0 18.0 16.0	5.6 4.6 1.6 7.0 8.0 19.0	C.S.
C.S.	3.8 5.4 6.0 30.0 18.0 13.0	5.7 1.2 1.3 4.0 9.0 16.0	L
L	2.0 5.5 18.0 12.0	5.3 1.9 1.5 5.0 10.0 19.0	L
L	5.9 6.9 6.0 21.0 19.0 17.0	5.7 4.3 3.8 6.0 8.0 18.0	C.S
L	5.8 7.1 7.1 5.6 22.1 23.0 18.0 15.0	5.8 6.2 7.8 5.0 6.0 19.0	C.S
C.S.	8.0 7.2 7.6 7.6 6.0 30.0 22.0 20.0 18.0 13.0	5.6 4.4 5.2 4.5 5.0 7.0 10.0 22.0	C.S
L	8.0 9.1 21.0 14.0	5.5 7.3 6.0 9.0	L
L	5.3 6.8 5.9 24.0 23.0 20.0 18.0	5.5 4.9 5.2 6.0 8.0 12.0	V
L	5.5 7.8 5.9 24.0 20.0 22.0 17.0	5.6 9.0 5.6 10.0 12.0 14.0 17.0	L
L	5.5 8.0 6.1 23.0 21.0 19.0 16.0	5.8 7.5 5.9 9.0 13.0 15.1 17.0	L
L	6.1 8.1 8.1 6.6 27.0 20.0 18.0 14.0	5.9 7.3 7.3 6.0 10.0 15.0 15.0 16.0	L
10" J Pine S of Sta 45			
L	6.0 7.7 7.7 6.3 23.0 20.0 18.0 15.0	5.6 7.4 7.4 5.5 11.0 12.1 15.0 17.0	L

Sta	-	H.I.	+	Elo
+		1346.87	7.22	
+63	7.2			39.7
47	6.5			40.4
48	4.5			42.4
49	4.6			42.3
50	5.5			41.4
51	7.6			39.3
P. +72.84	9.80			1337.07
+		1340.00	2.93	
P A M	5.09			1334.91
+		1338.24	3.33	
+76.76	1.2			37.0
52	1.5			36.7
+50	2.8			35.4
53	3.3			34.7
+50	4.2			34.0
54	4.1			34.1
+50	4.1			34.1
55	7.6			30.6
+56.01	9.0			29.2
+56	10.6			27.6
P +80.25	12.15			1326.09
+		1327.35	1.26	
57	1.2			26.2
58	1.3			26.1

HI 5,6

10-1-25 17

L	E	R.
L	6.3 7.4 9.4 6.3	5.5 7.0 5.7
	21.0 20.0 19.0 13.0	10.0 14.0 16.0
L	5.8 9.4 5.9	5.5 6.8 6.8 4.9 4.4
	22.0 19.0 17.0 13.0	11.0 13.0 10.0 16.0 24.0
L	5.3 5.8 9.0 6.0	6.0 9.2 5.8
	30.0 23.0 17.0 12.0	12.0 15.0 17.0
L	5.6 6.1 6.0	5.5 6.0 5.1
	20.0 16.0 12.0	13.0 17.0 2.4
L	5.3 5.9 6.4 6.3 5.5	5.7 6.0 6.1 5.2
	31.0 19.0 17.0 15.0 12.0	17.0 21.0 25.0 2.9
L	5.1 7.0 9.0 5.5	5.9 6.3 5.6 5.5
	19.0 15.0 15.0 12.0	19.0 21.0 22.5 30.0
L	5.6 7.0 7.0 6.0	6.0 5.6 6.0
	18.0 16.0 14.0 10.0	28.0 2.9

SW of PI 53 + 81.7

On Pine?

L	5.5 7.1 7.1 6.1	6.1 5.7
	19.0 16.0 14.0 10.0	28.0 32.0
L	5.6 7.1 5.8	6.5 6.1
	19.0 15.0 10.0	26.0 34.0
L	5.1 7.2 7.2 5.6	5.4 5.9
	9.0 6.0 4.0 1.0	17.0 34.0
L	5.2 5.7	5.4 7.1 7.1 5.9 5.5
	25.0 20.0	10.0 11.0 13.0 17.0 30.0
C.S.	5.3	5.8 7.2 7.2 6.7
	18.0	29.0 32.0 34.0 39.0
L	5.6	5.4 7.6 7.6 6.9
	18.0	22.5 25.0 29.0 36.0
C.S.	5.5 5.6	5.6 8.4 7.5 7.3 7.0
	26.0 20.0	3.0 6.0 11.0 24.0 38.0
C.S.	2.6 2.8 6.0 6.0	5.4 9.4
	27.0 10.0 8.0 5.0	21.0 26.0
C.S.	1.8 2.2 5.8 5.5	6.0 10.7
	28.0 13.0 14.0 9.0	13.0 16.0
C.S.	1.6 2.0 5.5	5.6 9.6
	22.0 17.0 14.0	12.0 17.0
C.S.	2.7 3.7 6.4 5.7	5.8 10.6 11.7
	24.0 15.0 12.0 6.0	18.0 23.0 30.0
C.S.	1.8 3.0 6.0 6.0 5.6	5.7 9.8 11.5
	27.0 16.0 12.0 10.0 7.0	19.0 27.0 30.0
C.S.	-6.1 -5.8 5.1 5.8 5.2	5.4 6.1 11.4
	29.0 15.0 10.0 6.0 3.0	10.0 25.0 31.0

Sta	-	HI	+	Elev
		1321.33		
69	1.4			19.9
70	6.6			14.7
BM	7.99			1313.34
PI+52.6	10.6			10.7
TP	10.03			1311.30
+		1313.47	2.17	
71	6.1			87.4
72	4.5			89.0
73	4.2			89.3
TP	4.23			1309.24
+		1311.74	2.50	
+65	3.4			8.3
+82	5.5			6.2
74	4.0			7.7
+58	4.9			6.8
75	4.3			7.4
76	4.1			7.6
+44	2.8			8.9
77	4.1			7.6
+46	3.5			8.2
TP	2.02			1309.72
+		1320.89	11.17	
+68	9.8			11.1

HI=5.6'

19

10-2-25

CS.	2.7	3.6	6.5	6.5	5.1	6.8	7.6	9.4	6.0	9.9	C.S.
	26.0	18.0	16.0	14.0	16.0	13.0	15.0	17.0	19.0	25.0	
L	0.0	0.6	6.9	5.5		5.7	6.5	8.8	9.4	9.9	
	24.0	16.0	9.0	5.0		5.0	17.0	24.0	26.0	35.0	
16" Pine SW of Sta 70+50.6											
CS.	1.9	4.2	6.7			4.5	4.2	4.4	5.6	5.4	
	15.0	8.0	4.0			5.0	14.0	23.0	27.0	32.0	

CS.	3.5	4.0	5.2			6.2	6.2	3.1	2.8	2.8	
	25.0	20.0	5.0			1.0	4.0	11.0	21.0	33.0	
L	4.8	4.7				6.0	7.4	7.4	6.5		L
	25.0	16.0				22.0	20.0	27.0	30.0		
V	5.4	6.1				6.1	6.5				
	26.0	11.0				20.0	33.0				

L	6.5	5.8	5.5			6.0	6.0				L
	31.0	26.0	14.0			13.0	27.0				
L	5.2	4.6				4.3	4.0				C.S.
	24.0	15.0				13.0	28.0				
L	7.5	7.2				4.7	4.5	5.0			
	22.0	14.0				15.0	28.0	35.0			
L	5.0	5.1				3.6	3.2				L
	28.0	13.0				18.0	29.0				
L	6.2	5.4				5.3	5.3				L
	28.0	14.0				18.0	28.0				
L	5.5	5.3				5.5	6.5				L
	28.0	17.0				17.0	29.0				
CS.	6.0	5.8				5.1	5.6	6.0			C.S.
	26.0	12.0				11.0	26.0	31.0			
L	5.6	5.6				5.6	5.4				C.S.
	28.0	14.0				21.0	31.0				
L	6.0	6.0				5.9	1.8				C.S.
	24.0	14.0				14.0	30.0				
											L
L	8.7	8.6	7.6			4.6	4.3	4.3			L
	32.0	24.0	13.0			8.0	15.1	2.5			

Sta	-	HI	+	Ele
+97.04	8.4	1320.89		12.5
70+99	2.6			18.3
79	4.1			16.8
P 80	2.25			1319.64
+		1328.08	9.44	
*46.38	10.6			17.5
BM	8.97	Contel. Pole NE Sta 81		1319.95
81	10.7			17.7
82	6.7			21.4
T.P	0.48			1327.60
+		1332.62	5.02	
83	4.4			28.2
+37	2.4			30.2
84	2.7			29.9
+40	2.3			30.3
85	3.7			28.9
+54	3.1			29.5
86	4.9			27.7
87	10.3			22.3
P	12.67			1319.95
+		1321.58	16.3	
88	5.7			15.9
+44	6.1			15.5
89	4.9			16.7
+79.86	10.1			11.5
90	11.4			10.2

HI=5.6"

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10-2-25

CS	8.0	9.2	6.6	4.8	3.9	6.3	5.3	3.6	L
	31.0	23.0	12.0	15.0	26.0	29.0	29.0	32	
CS	7.9	9.2	5.9	3.4	3.0	2.7	3.0	3.0	1.5
	27.0	18.0	1.0	5.1	19.0	29.0	32.0	34.0	35.0
CS	6.3	6.0	7.8	5.4	6.2	6.0	4.6	9.0	CS
	38.0	22.0	15.0	12.0	9.0	9.0	15.0	19.0	25.0
L	6.6	6.5	9.7	5.4	6.4	6.4	4.6	4.4	CS
	31.0	20.0	17.0	12.0	8.0	13.0	14.0	21.0	26.0
L	7.2	6.9	7.7	5.4	5.8	7.0	7.0	5.3	4.8
	31.0	23.0	19.0	15.0	9.0	4.0	15.0	16.0	18.0
CS	5.7	5.8	7.5	5.6	5.6	7.2	7.2	5.0	4.5
	27.0	17.0	16.0	10.0	4.0	13.0	15.0	17.0	19.0
CS	5.7	5.7	7.5	5.7	7.7	5.6	5.5		CS
	26.0	17.0	15.0	13.0	11.0	15.0	18.0	26.0	
CS	6.0	6.1	7.6	6.2	7.7	7.7	6.0	5.6	CS
	25.0	17.0	15.0	7.0	13.0	15.0	17.0	18.0	28.0
CS	6.8	7.2	6.8	5.7	7.2	7.2	4.7	4.0	CS
	40.0	32.0	17.0	17.0	15.0	12.0	11.0	14.0	16.0
CS	7.8	6.7	8.1	6.0	7.0	7.0	4.1	5.1	L
	30.0	20.0	18.0	15.0	11.0	11.0	13.0	15.0	16.0
CS	6.7	6.6	7.4	5.6	6.7	6.7	4.8	4.2	CS
	30.0	18.0	16.0	14.0	11.0	9.0	11.0	14.0	16.0
CS	6.8	5.9	7.4	5.7	7.2	7.2	5.8	6.0	6.4
	32.0	21.0	19.0	17.0	14.0	9.0	11.0	13.0	15.0
CS	3.4	3.7	6.0	5.8	7.8	7.8	6.3	6.4	7.3
	30.0	22.0	17.0	17.0	14.0	8.0	11.0	15.0	16.0
CS	2.4	2.7	3.7	5.7	7.6	7.6	6.2	6.9	CS
	33.0	25.0	23.0	20.0	18.0	16.0	8.0	10.0	12.0
CS	3.4	4.8	6.4	5.8	7.6	8.6	8.0		CS
	33.0	23.0	21.0	19.0	15.0	5.0	8.0	15.0	24.0
CS	7.1	7.3	7.9	5.8	7.9	7.9	6.5	6.1	CS
	33.0	22.0	21.0	15.0	4.0	7.0	9.0	10.0	24.0
L	5.0	6.8	6.8	5.6	7.1	5.4	6.2		CS
	23.0	22.0	20.0	19.0	6.0	5.0	8.0	10	23.0
CS	3.4	4.1	6.2	5.6	7.9	6.9	7.5	8.2	CS
	33.0	25.0	24.0	22.0	18.0	3.0	8.0	7.0	18.0
CS	4.2	4.7	6.4	5.4	7.7	7.1	7.8		CS
	34.0	27.0	25.0	23.0	21.0	15.0	2.0	6.0	9.0

Sta	-	HI	+	Ele
TP +50	12.14			1309.44
+		1316.14	6.70	
91	6.7			09.4
+50	7.5			08.6
92	6.6			09.5
+07.36	6.4			09.7
93	4.7			11.4
94	3.7			12.4
+35.42	3.9			12.2
95	3.9			12.2
P 96	3.22			1312.92
+		1317.92	5.00	
+95.4	3.4			14.5
97	3.4			14.5
98	4.9			13.0
99	4.7			13.2
100	6.7			11.2
+34.4	7.0			10.9
101	7.9			10.0
102	7.8			10.1
BM	3.06			1314.86
P +44.	7.15			1310.77
+		1323.09	12.32	
103	11.5			11.6

HI=56'

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5.0	4.0	5.7	5.7	4.4	5.1	5.7	6.8	9.6	4.8	5.2	C.S.
40.0	29.0	25.5	22.0	20.0	7.0	4.0	6.5	7.0	19.0	29.0	
3.6	4.0	5.4	5.4	4.9		5.7	6.3	6.3	5.3	5.7	6.2
37.0	29.0	27.5	25.0	23.0		4.0	5.0	7.0	8.0	19.0	28.0
4.1	4.9	4.9	4.4	4.8		5.6	6.7	7.1	7.4	7.3	L
34.0	31.0	28.0	24.0	23.0		2.0	4.0	8.0	13.0	23.0	
4.4	5.3	5.3	4.6	4.8		6.0	7.2	8.3	8.7		C.S.
29.0	26.0	24.0	23.0	12.0		5.0	9.0	17.0	27.0		
4.4	5.2	5.8	5.3			5.8	7.4	7.4	6.9	8.1	C.S.
31.0	23.0	20.0	18.0			9.0	12.0	14.0	16.0	23.0	
7.2	6.7	6.9	5.8			6.1	7.7	2.7	6.9	6.7	C.S.
26.0	18.0	16.0	12.0			16.0	19.0	24.0	22.0	28.0	
6.4	5.7	6.5	6.5	5.6		5.9	7.3	7.3	6.5	6.2	C.S.
25.0	17.0	16.0	14	12.0		7.0	18.0	20.0	22.0	28.0	
7.2	5.7	6.6	5.7			5.6	6.8	6.8	5.4	4.8	C.S.
24.0	17.0	15.0	12.0			13.0	15.5	17.0	18.0	24.0	
7.0	5.8	7.1	6.1			5.2	6.4	6.1	4.2	2.8	2.6
25.0	18.0	15.0	13.8			11.0	13.0	15.1	17.0	23.0	24.0
2.2		3.0	15.0			5.4	-1.8	-3.1			C.S.
2.2	6.8	7.3	6.0			12.0	21.0	28.0			
22.0	19.0	18.0	15.0								
7.4	6.1	6.9	6.9	5.7		5.6	6.5	6.5	3.4	2.5	2.0
25.0	18.0	17.0	15.0	12.0		9.0	11.0	13.0	16.0	17.0	24.0
6.7	5.3	6.2	5.6			7.1	7.2				L
25.0	18.0	17.0	13.0			19.0	29.0				
6.1	4.3	5.3				5.6	8.1	7.5			
24.0	17.0	14.0				13.0	16.0	28.0			
5.6	4.4	4.6	5.8	5.7		5.9	7.8	8.4			L
26.0	21.0	17.0	14.0	12.0		13.0	16.8	25.0			
3.9	4.1	6.0	6.0	5.4		5.6	7.4	8.1			L
29.0	17.0	15.0	13.0	10.0		12.0	16.0	23.0			
5.2	7.7	7.2	5.9			5.7	7.8	7.5			
23.0	18.0	15.0	10.0			14.0	22.0	30.0			
NW Sta 98 on the Pole											
4.8	8.1	8.2	5.4			5.6	8.6				L
28.0	22.0	15.0	10.0			16.0	23.0				
5.5	2.2	8.2	5.7			5.9	8.0				L
30.0	20.0	15.0	9.0			14.0	18.0				

Sta	-	HI	+	E1 ₀
104	10.7	1323.09		12.4
105	9.7			13.2
106	5.0			18.1
107	+0.2			1323.29

H.I. = 5.6'

22

10-2-25

L	10.5	10.1	6.1	5.9	10.4		L
	23.0	17.0	11.0	13.0	21.0		
	10.7	8.7	6.4	6.1	9.7	11.2	L
	22.0	15.0	11.0	11.0	17.0	27.0	
L	12.1	11.7	5.7	5.8	11.4	11.9	CS
	25.0	21.4	12.0	11.1	21.0	25.0	
CS	2.1	2.5	5.4	5.7	6.2	4.3	4.6
	32.0	21.0	17.0	8.0	14.0	18.0	26.0

Revision from Sta 68+79.32

Sta	-	HI	+	Elev
BM		1320.61	7.27	1313.34
69	0.7			19.9
70	6.1			14.5
71	10.8			09.8
72	11.6			09.0
+19.32	11.7			08.9
73	12.2			08.4
74	12.5			08.1
P +36.48	12.42			1308.19
+		1315.04	6.85	
+51	6.8			08.2
75	6.5			08.5
+58	5.6			09.4
76	5.6			09.4
+42.04	6.0			09.0
77	5.3			09.7
P 78	1.42			1313.62
+		1322.60	8.98	
79	5.8			16.8
+60.45	2.3			20.3
BM	2.65			1319.95
80+00	3.8			1318.80

331.46

To Sta 79+60.45

HI = 5.6'

23

10-2-25

SW of Sta 70+50 on 16" V Pine

CS	2.2	3.6	6.5	6.5	5.1	6.8	7.6	7.6	6.0	7.7	CS	
	26.0	18.0	16.0	14.0	10.0	18.0	18.0	17.0	17.0	25.0		
CS	-0.1	0.3	6.7	6.7	5.2	6.7	8.3	9.2	9.6			
	33.0	24.0	16.0	14.0	11.0	12.0	16.0	22.0	31.0			
	7.3	8.1	8.8	8.1	5.9	5.6	6.4	6.4	5.0	4.5	4.2	
	32.0	21.0	20.0	15.0	11.0	11.0	13.0	16.0	18.0	24.0	29.0	
L		6.0	7.8	7.8	5.6	6.1	7.2	7.2	5.4	5.0	5.2	
		21.0	19.0	12.0	14.0	10.0	11.0	13.0	15.0	25.0	32.0	
L	6.0	6.1	7.8	7.8	5.9	6.2	7.8	7.8	5.0	4.0	5.0	
	30.0	22.0	22.0	18.0	14.0	11.0	12.0	14.0	17.0	24.0	32.0	
L		6.0	7.7	7.7	5.9	5.8	7.3	7.3	5.2	4.5		
		24.0	22.0	20.0	16.0	14.0	14.0	11.0	13.0	16.0	23.0	
L		5.7	7.0	7.0	5.9	5.6	7.2	7.2	5.2	4.7	CS	
		26.0	25.0	22.0	20.0	8.0	10.0	12.0	13.0	22.0		
L		6.8	7.3	7.3	5.8	5.7	7.2	7.2	5.6	5.2	CS	
		27.0	25.0	23.0	16.0	7.0	11.0	13.0	16.0	28.0		
L	6.6	6.8	7.1	7.1	5.9	5.7	7.2	7.2	5.4	5.1	CS	
	33.0	27.0	24.0	21.0	16.0	9.0	11.0	13.0	16.0	24.0		
L		5.2	5.3	6.8	6.8	5.4	6.9	6.9	5.1	4.8		
		35.0	23.0	20.0	18.0	14.0	17.0	19.0	22.0	31.0		
L		4.6	6.7	6.4	5.6	5.6	6.8	6.8	5.6		L	
		20.0	17.0	15.0	14.0	16.0	13.0	20.0	23.0			
CS		5.6	6.8	7.1	6.1	5.7	7.7	6.8	6.8		L	
		29.0	16.0	15.0	12.0	13.0	16.0	17.0	23.0			
L	7.3	7.4	8.2	8.2	6.1	5.4	5.9	8.0	6.8	6.7	CS	
	26.0	17.0	15.0	13.0	11.0	5.0	11.0	15.0	16.0	24.0		
CS	8.7	7.3	7.3	5.8		5.4	5.4	6.6	6.6	5.3	5.6	
	29.0	23.0	12.0	10.0		3.0	12.0	14.0	16.0	17.0	26.0	
CS	6.8	6.7	7.8	7.8	6.0	5.4	5.5	6.7	6.7	3.7	L	
	26.0	17.0	16.0	14.0	11.0	1.0	13.0	14.0	16.0	17.0		
CS	6.1	6.0	7.6	7.6	5.6	5.6	6.8	6.3	5.3	5.4	CS	
	28.0	17.0	16.0	14.0	10.0	13.0	15.0	17.0	18.0	30.0		
CS		7.3	6.8	8.1	6.1	5.4	6.4	5.6	5.6	4.1	L	
		24.0	16.0	14.0	10.0	3.0	15.0	14.0	19.0	22.0		
on Tel. Pole NE Sta 81+00												
CS	6.3	6.0	6.0	7.5	7.5	6.1	5.4	6.2	6.5	4.6	4.0	CS
	22.0	24.0	17.0	14.0	11.0	9.0	13.0	18.0	21.0	23.0	30.0	

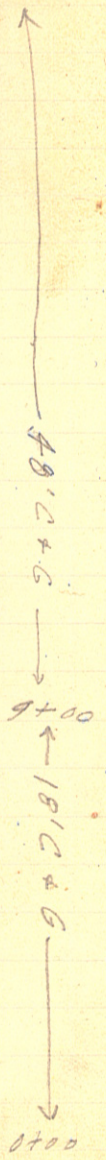
S.A.R #6 Job #2602

Sta	Defl.	Angle	Mag. Bearing
-----	-------	-------	--------------

P.O.T. 20+00

0+00

N83°E



Cass County

27

10-3-25

Weather - Partly Cloudy
+ Cool

Party {
Taubman π
B. Nowatt Rod
B. Knopf Chain

21
20 RPs {
Tel. Pole 74.4' NW
Oak Stump 30.5' S

18 12" 24 CMC In Place Sta 18+30

14 FE Sta 14+85

6 12" x 14" CMC In Place Sta 6+53
No good

Cor. of Secs. {
25, 36
30, 31

137-30
137-29

Sta Defl. Angle Mag. Bearing

POT 38+44.53

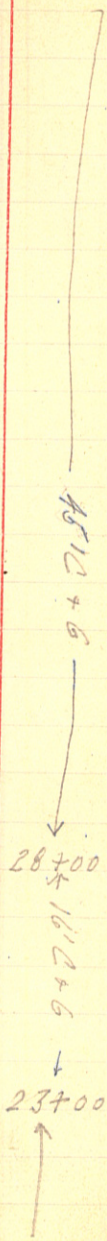
25+99

∟

0°05'

N82°55'E

22+00



44

43

42

41

40

39

38

37

36

35

34

33

32

31

30

29

28

27

26

25

24

23

22

PPs {
 W. Pine ^{STUMP} NE 43.0'
 " " Stump SE 34.9'

FE Sta 26+00

1/4 Cor. Between

Secs. 30, 31-137-29

PPs {
 8" Oak 83' SE
 " " 94' S

FE Sta 24+20

Sta	Defl.	Angle	Mag. Bearing
-----	-------	-------	--------------

52+53.5	R	0°08'	N83°03'E
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45+00

45' D + G

67
66
65
64
63
62
61
60
59
58
57
56
55
54
53
52
51
50
49
48
47
46
45

Cor. Sec's. 29, 30, 31, 32-137-29.
Town Road

Sta 53+82
12" X 17' O.M.C. I.P. No good
RPs { 10" N Pine N 91.8'
10" Oak SW 38.9'
Town Road

Sta	Defl	Angle	Mag Bearing
-----	------	-------	-------------

P.O.T.
90+53.3

78+94.1

P.O.T. 74+92.3

68+00

No. 2 a 5
79+00
4610+6

Sta 86

Meadow

Sta 79

1/4 Cor. Between Sec's.

29,32-137-29

FF Sta 71+00

90 RP { 5" Oak NW 59.0'
Tel Pole NE 57'

89

88

87

86

85

84

83

82

81

80

79

78

77

76

75

74

73

72

71

70

69

68

24" X 30' CMC In Place Sta 82

Offtake Ditch

RP { 8" Aspen W 79.2'
" 36' 036"

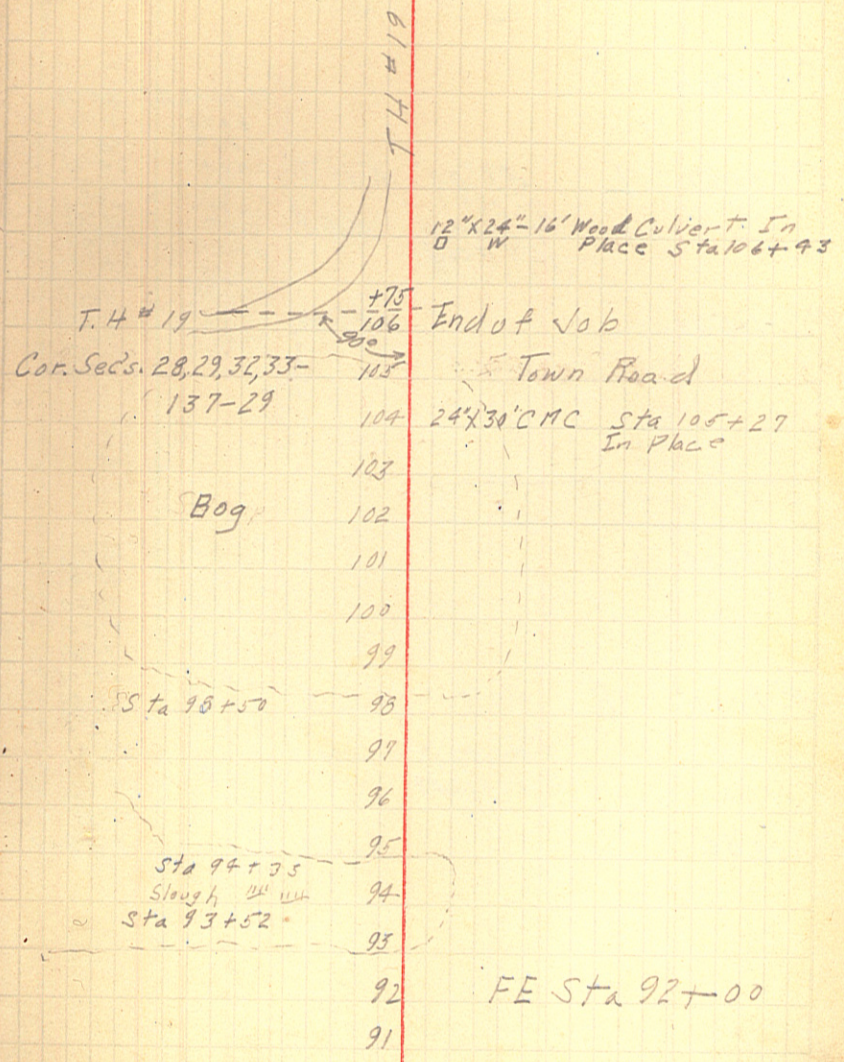
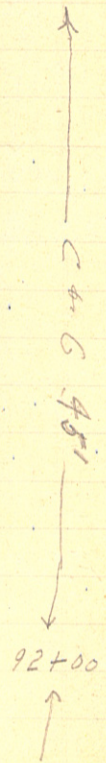
RP { 5" Oak SW 52.0'
" " SE 42.4'

24" X 16' CMC In P. Sta 69+21

Sta Defl Angle Mag Bearing

106+95
105+45.5 L 0°25' N82°38'E

91+00



12" x 24" - 16' Wood Culvert In Place Sta 106+93

End of Job
Town Road
24" x 30" CMC Sta 105+27 In Place

Sta 96+50

Sta 94+35
Slough
Sta 93+52

FE Sta 92+00

SAR# 6 Job # 2602

6-25-26

Party { CARTaubman Asst. 32
 O. Ness - Rod
 Earl Rosh - Chain

Weather - Clear & Warm

Sta Defl. Angle Mag. B.

PT 1+94.16

P.L. 0+00 L

89°00' N83°E

D=29°
 T=194.16
 L=306.89

Defls

PT 1+94.16	44°39'	✓
++75	41°43'	✓
1+50	38°06'	✓
1+25	34°28'	✓
1+00	30°51'	✓
0+75	27°13'	✓
0+50	23°36'	✓
0+25	19°58'	✓
0+00	16°21'	✓
-0+25	12°43'	✓
-0+50	9°06'	✓
-0+75	5°28'	✓
-1+00	1°51'	✓

PC -1+12.73

S8°W.

PC -1+12.73

PT: 1+99.25

P.L. 0+00 R

90°30' N83°E

D=21°
 T=199.75
 L=312.09

Defls

1+99.25	45°18'	✓
++75	41°43'	✓
1+50	38°06'	✓
1+25	34°28'	✓
1+00	30°51'	✓
0+75	27°13'	✓
0+50	23°36'	✓
0+25	19°58'	✓
0+00	16°21'	✓
-0+25	12°43'	✓
-0+50	9°06'	✓
-0+75	5°28'	✓
-1+00	1°51'	✓

PC -1+12.82

N6°30'W

PC -1+12.82

Revised
 Page 33

PT
 SAR#6
 PT

46.669'

2" Exposed
4" Below

N 82° 30' E

#1

RP { N.W. Sec 21 - 139-30
S.W. " 28 - 139-30 ✓

127	60
582	30 W
45	
127	30 E
52	30
57	

#2

RP { NW Sec 21 - 139-30
SW " 28 - 139-30

SAR #7

#3 RP { S.E. Sec 27 - 139.30
S.W. " " - 139-30

Sta 105 + 46.5

SAR # 6

RP { NW Sec 29 - 137-29
NE " 28 - 137-29

79 + 44.1

RP { NW " 29 - 137-29
S.W. " 32 - 137-29

N 83° E 82.30

82 165.
45

5 37 15 W

179 60
127 15

5 52 45 E

5 83 0.3 W

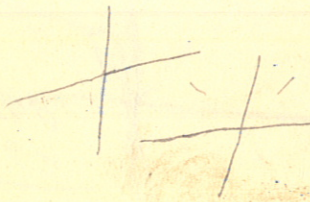
45

N 39° 03 E

128 63

N 51° 57 W

21 | 22
28 | 27



N 82° 30' E

S 82° 30' W

~~90~~
~~179 60~~

~~172 30~~

~~S 45° 30' E~~ x

~~45~~
S 52° 00' E

S 37° 30' W

$$PT0+89.0 = 0+56.3$$

$$P10+00 = 89^\circ \quad L$$

$$PC0+00 \quad D=100^\circ \text{ Ext } 23.03 \quad T=56.3$$

$$L=99.0'$$

Def 1

$$\left. \begin{array}{l} 2+89 = 49^\circ 50' \\ 0+80 = 40^\circ \\ 0+78 = 38^\circ \\ 0+60 = 30^\circ \\ 0+50 = 25^\circ \\ 0+48 = 20^\circ \\ 0+30 = 15^\circ \\ 0+20 = 10^\circ \\ 0+10 = 5^\circ \end{array} \right\}$$

$$PT0+90.5 =$$

$$0+57.8$$

$$P10+00 = 90^\circ 30' \quad R$$

$$PC0+00 \quad D=100^\circ \text{ Ext } T=24.09' \quad T=57.8' \quad L=90.5'$$

$$L=90.5'$$

Def 1

$$\left. \begin{array}{l} 2+90.5 = 45^\circ 15' \\ 0+90 = 40^\circ \\ 0+78 = 35^\circ \\ 0+60 = 30^\circ \\ 0+50 = 25^\circ \\ 0+40 = 20^\circ \\ 0+30 = 15^\circ \\ 0+20 = 10^\circ \\ 0+10 = 5^\circ \end{array} \right\}$$

SAR #6